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Generalizing and Applying Evidence

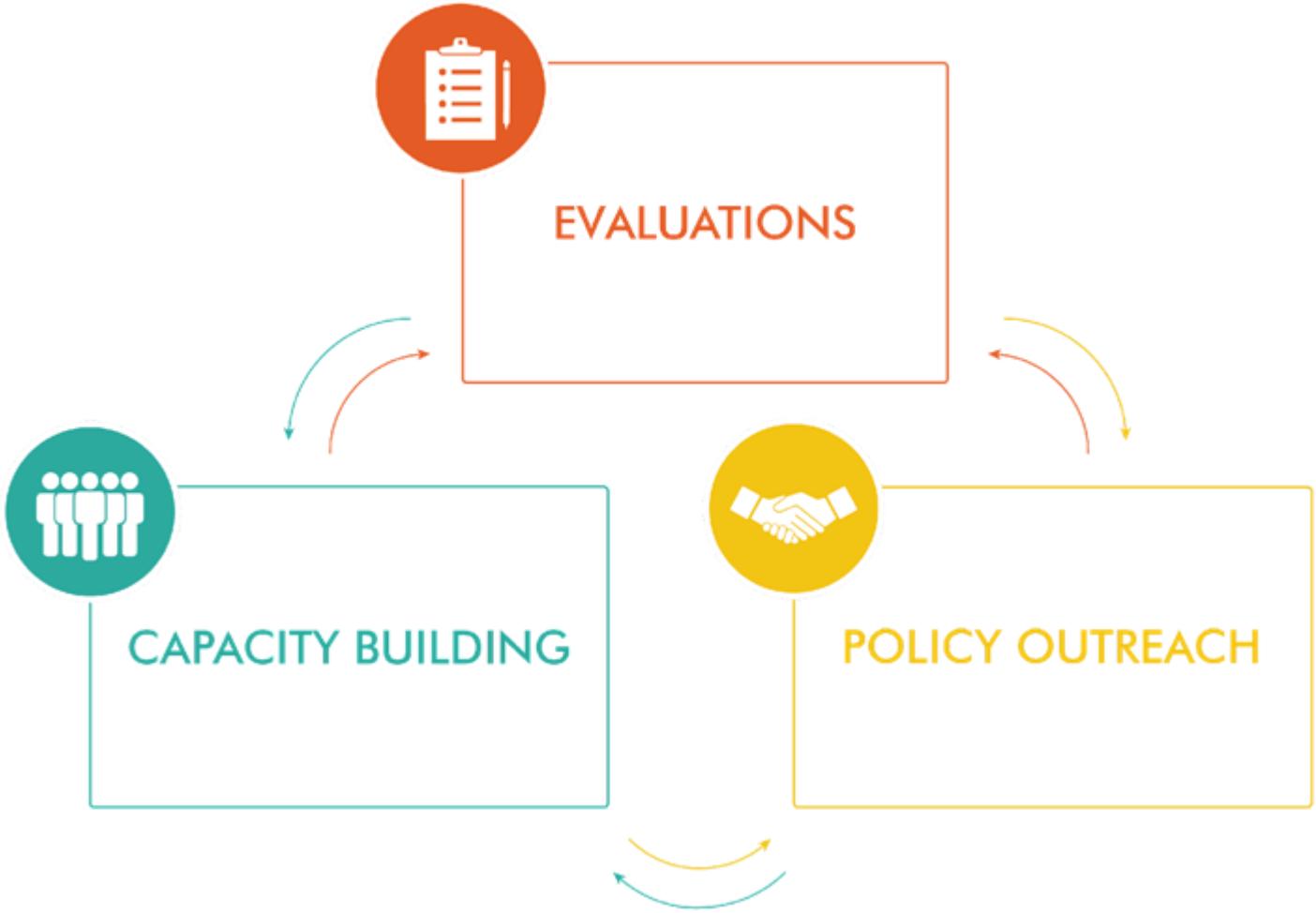
Hannah Reuter, J-PAL North America
North Carolina OSBM 2021 Performance Management Academy

Ground rules

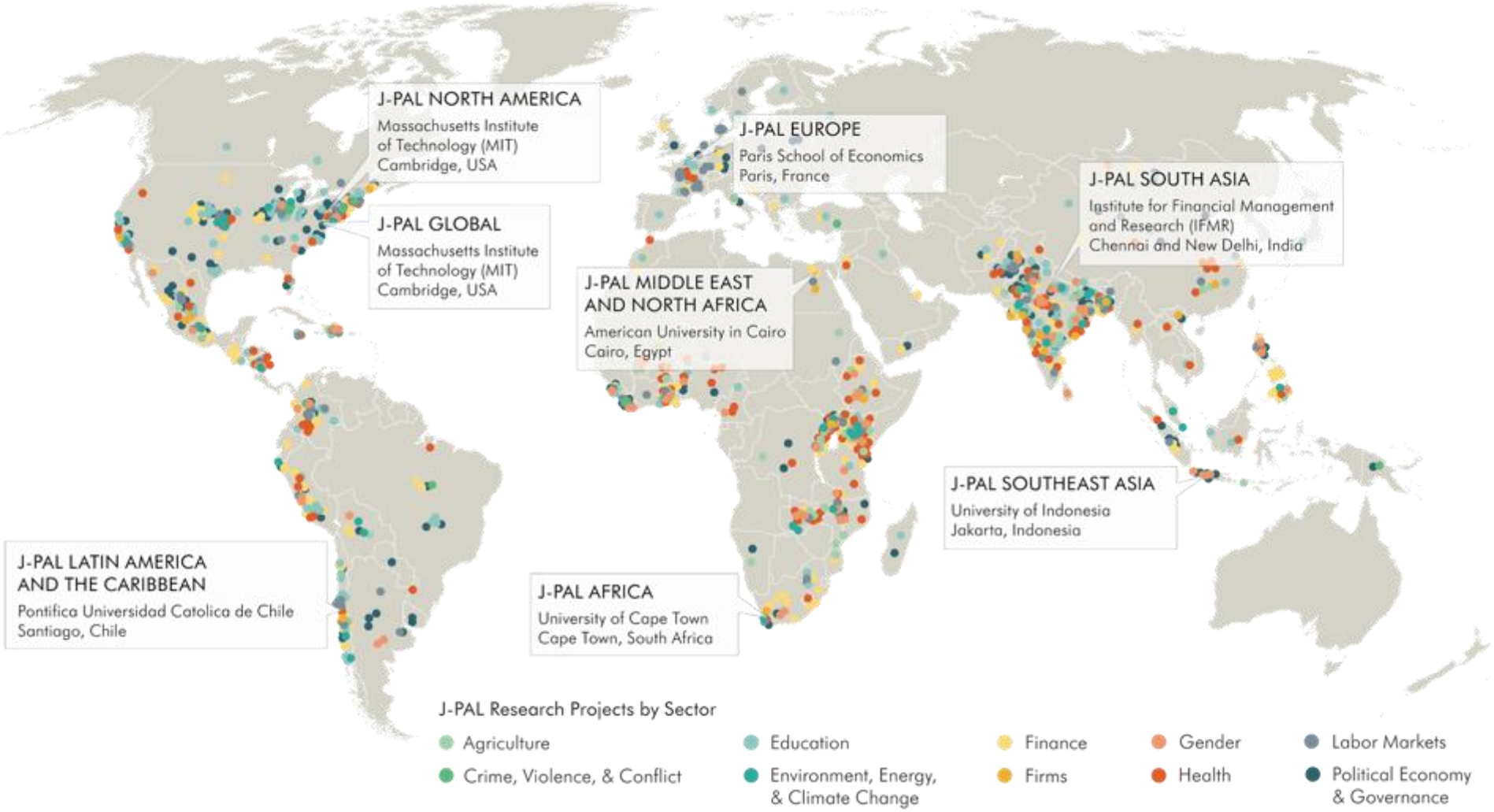
- We will be using a tool called Menti today. It may be helpful to have your cell phone handy.

- Jot down any questions you might have as they come up. We'll periodically pause for Q+A.

J-PAL's mission is to reduce poverty by ensuring that policy is informed by scientific evidence



Our evaluations



Learning Objectives

- Introduce and apply a generalizability framework, which provides a systematic way to assess how evidence applies or does not apply to a new context
- Review concrete examples of whether to scale up evidence-based interventions in new contexts

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Menti open response

Go to www.menti.com
Enter code: 97 40 22 8

The Challenge

- In context of limited resources, how do we know which programs provide the most value?
- To date we have seen a number of rigorous impact evaluations across many policy areas, but finding evidence that is perfectly relevant to your context is probably unlikely

"We keep running into the same problem from place to place to place. … The solutions, in a sense, can be the same. **You learn something general**, and from this general finding, you can **extract a lesson that policymakers will then tailor to each individual context**."

Esther Duflo, interview after the announcement of the 2019 Prize in Economic Sciences https://bit.ly/2WI37Bk

A randomized evaluation of a text message parental notification program in a West Virginia school district reduced course failures by nearly 30% (Bergman, Chan, 2019)

Photo: Shutterstuck.com

If you're a North Carolina education leader, how do you know if this program would also work **in your context?**

Example: Parental notification text messages

- Study by Peter Bergman and Eric Chan (published in the *Journal of Human Resources)*
- Location: Kanawha County, West Virginia
- 1,137 parents of students in 22 middle and high schools
- The researchers sent parents information about their child's class absences, missed assignments, and grades via automated text message to assess the impact of providing information to parents on student achievement
  - Provided **information** to correct parents' beliefs about their child's academic behaviors and performance
  - Empowered parents to **take action** to monitor and improve their child's academic behaviors and performance

Parent alert: Jaden has 5 missing assignments in science class. For more information log in online.

Bergman & Chan 2019

Results from Study

Outcomes	Treatment	Control
Course Failures	.71 classes	.97 classes
Courses Attended	312 classes	278 classes

27 percent

12 percent

Impacts were larger for students with below average GPA

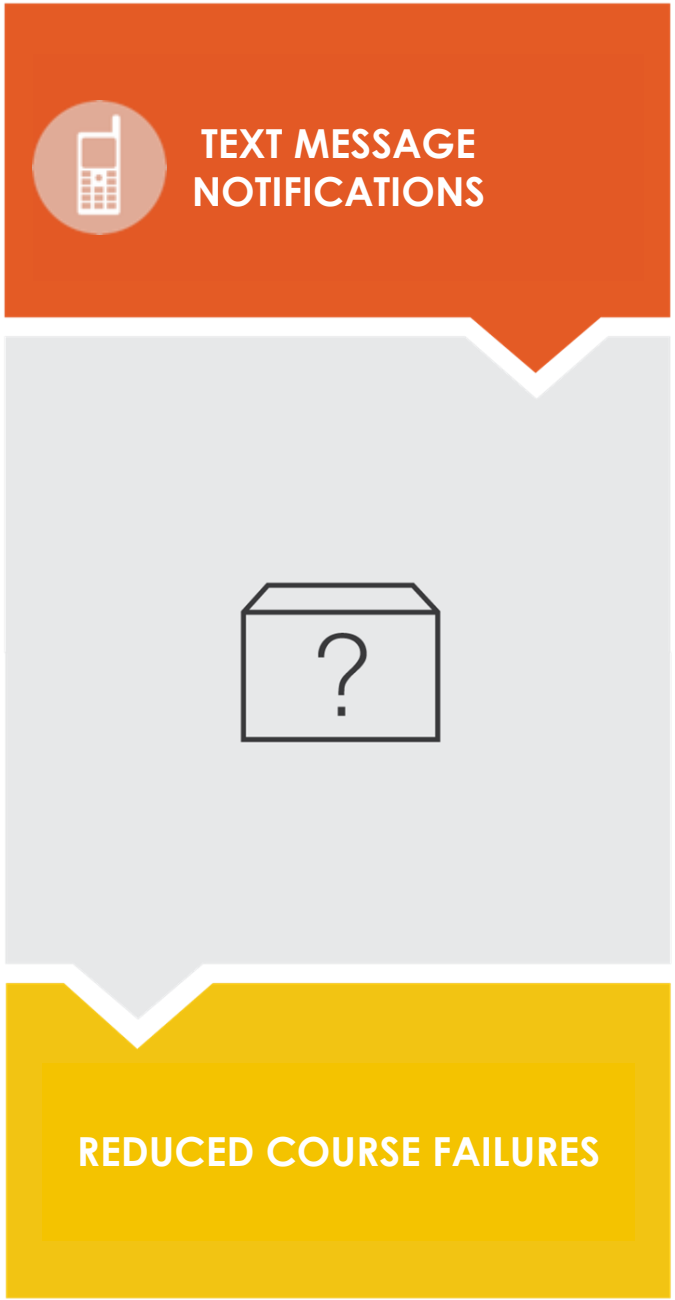
Bergman & Chan 2019

Viewing evidence in isolation

If a school district in North Carolina wanted to reduce course failures, should they consider text message reminders?

- Only one RCT in West Virginia; not North Carolina

How can we determine if this program will work somewhere else?



Should school districts in North Carolina replicate the text message parental notification program?

Share some reasons why you said yes or no. Please unmute yourself to share.

Four misguided questions

- What counts as a "similar enough" new setting?
  - Can a study inform policy only in the location in which it was undertaken?
- Should we use only whatever evidence we have from our specific location?
- Should a new local randomized evaluation always precede scale up?
- Must an identical program or policy be replicated a specific number of times before it is scaled up?

Are the locations identical?

Is there a similar problem?

Why did a solution work?

Key Principles of The Generalizability Framework

- Instead of focusing on place and time, focus on people
  - Key conditions and general lessons about behavior
- Evidence from single study just one part of the puzzle
  - We weigh the evidence based on quality and adjust priors
- Combine theory, descriptive evidence, and results of rigorous impact evaluations to answer:
  - Whether results from one context likely to replicate in another
  - When we need more evaluation and when we don't
- For more detail, see Mary Ann Bates and Rachel Glennerster, "The Generalizability Puzzle," *Stanford Social Innovation Review*, 2017. https://ssir.org/articles/entry/the_generalizability_puzzle

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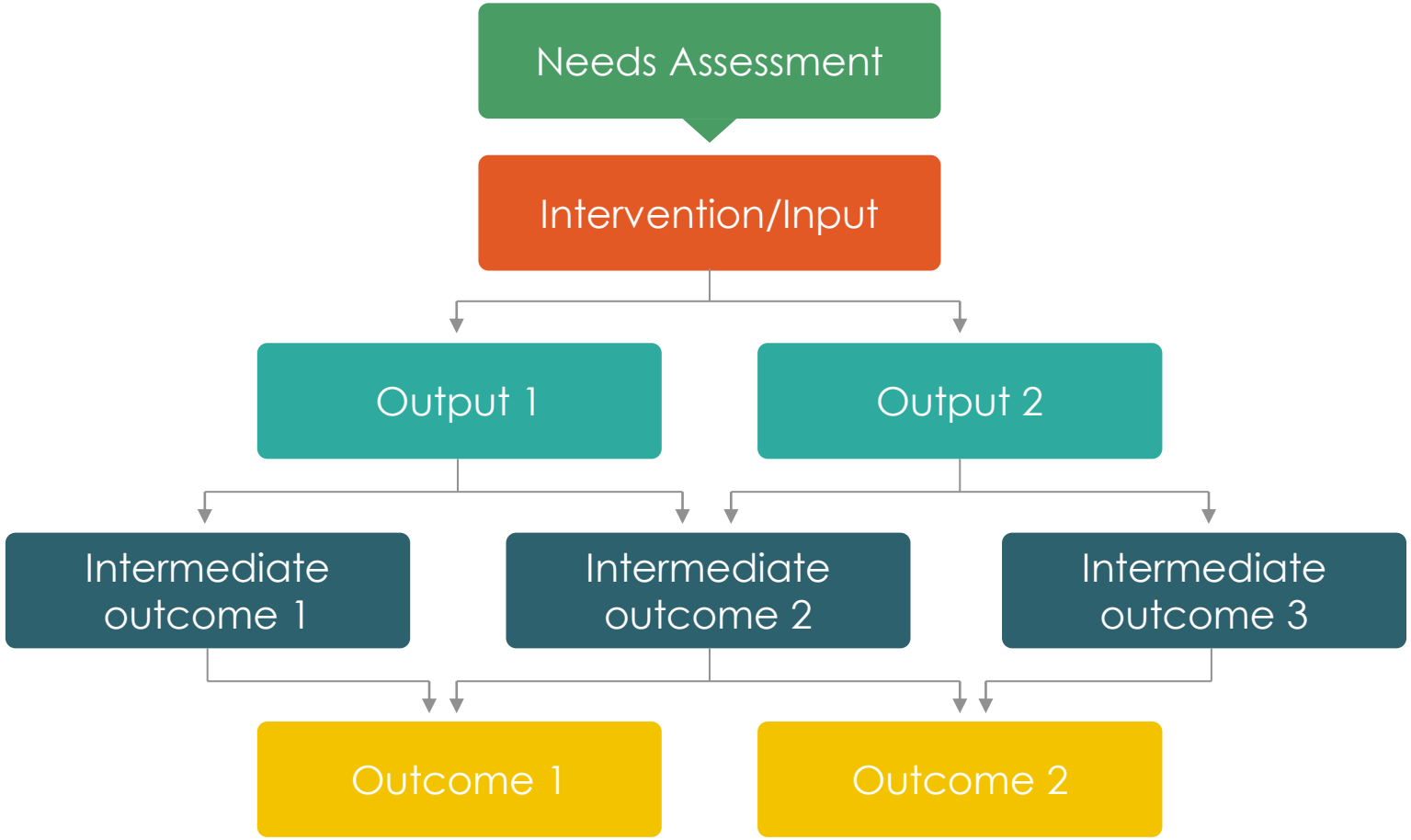
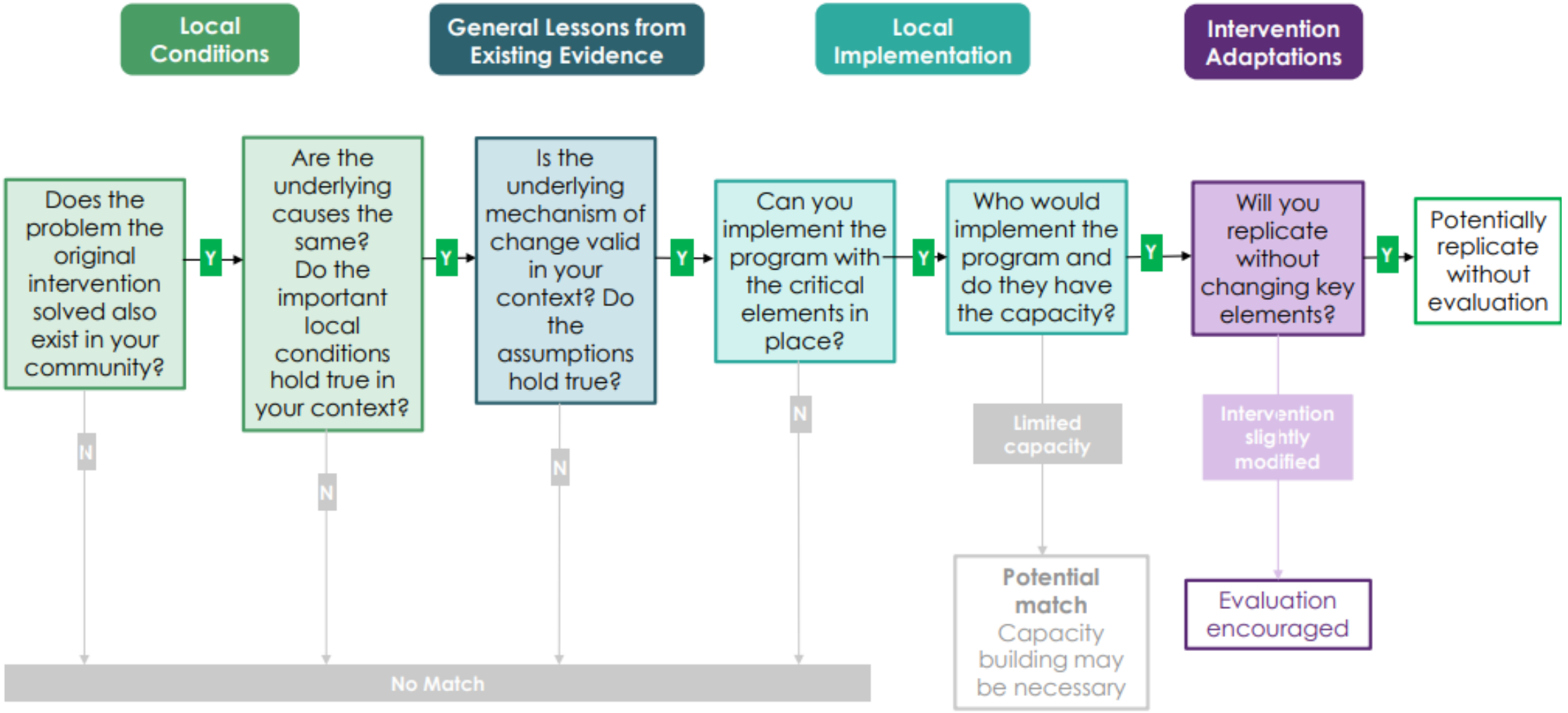
The "how" of applying the Generalizability Framework

Start with a **theory of change** for the previous program …



The "how" of applying the Generalizability Framework

… then walk through a series of guided questions



Applying the Generalizability Puzzle Framework

Examples

1. Texting parents about student performance
2. Tutoring/teaching at the right level

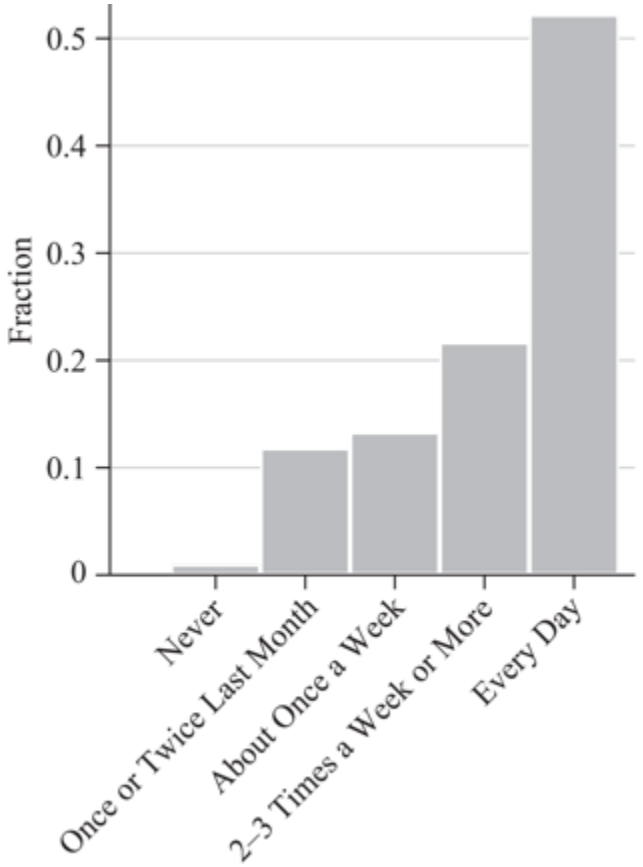
Case Study 1: Text Message Notifications

- West Virginia program to reduce course failures, tested with RCT
  - Bergman, Chan 2019

- Provided **information** to correct parents' beliefs about their child's academic behaviors and performance
- Empowered parents to **take action** to improve their child's academic behaviors and performance

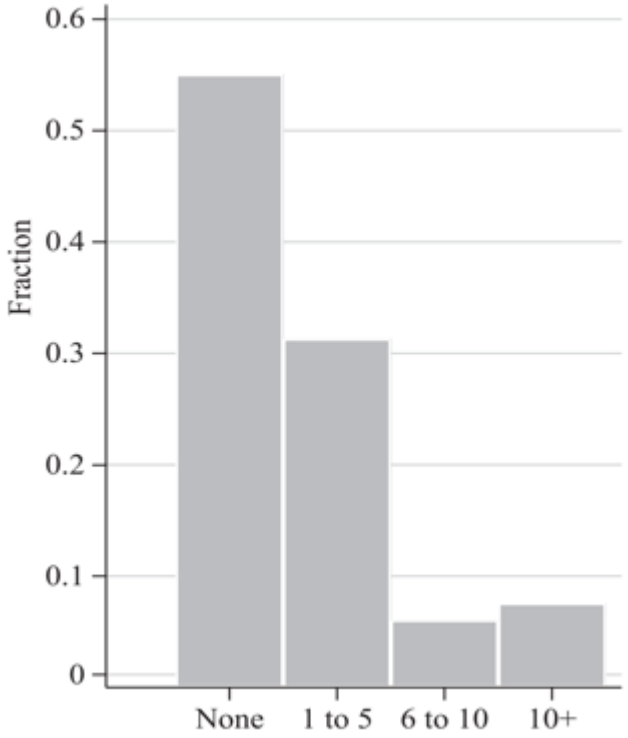
Case Study 1: Text Message Notifications

How often do you talk to your child about schoolwork?



Most parents report speaking to their children **every day** about their homework

How many assignments has your child missed?



Over **50 percent of parents** believed their children had missed no assignments.

Case Study 1: Text Message Notifications

In actuality, only **20 percent** of respondents' children had missed no assignments even though **over 50 percent** of parents thought their children have never missed an assignment.

Case Study 1: Text Message Notifications

- **50 percent** of parents heard from the school less than once every three months
- **48 percent** of parents believed their child does not disclose enough information about their academic progress for them to be easily involved in the child's education → negatively correlated with student's GPA
- Parents with older or lower-performing children were more likely to perceive that their child is not telling them enough about their schoolwork.

Imagine you are considering replicating or adapting this program

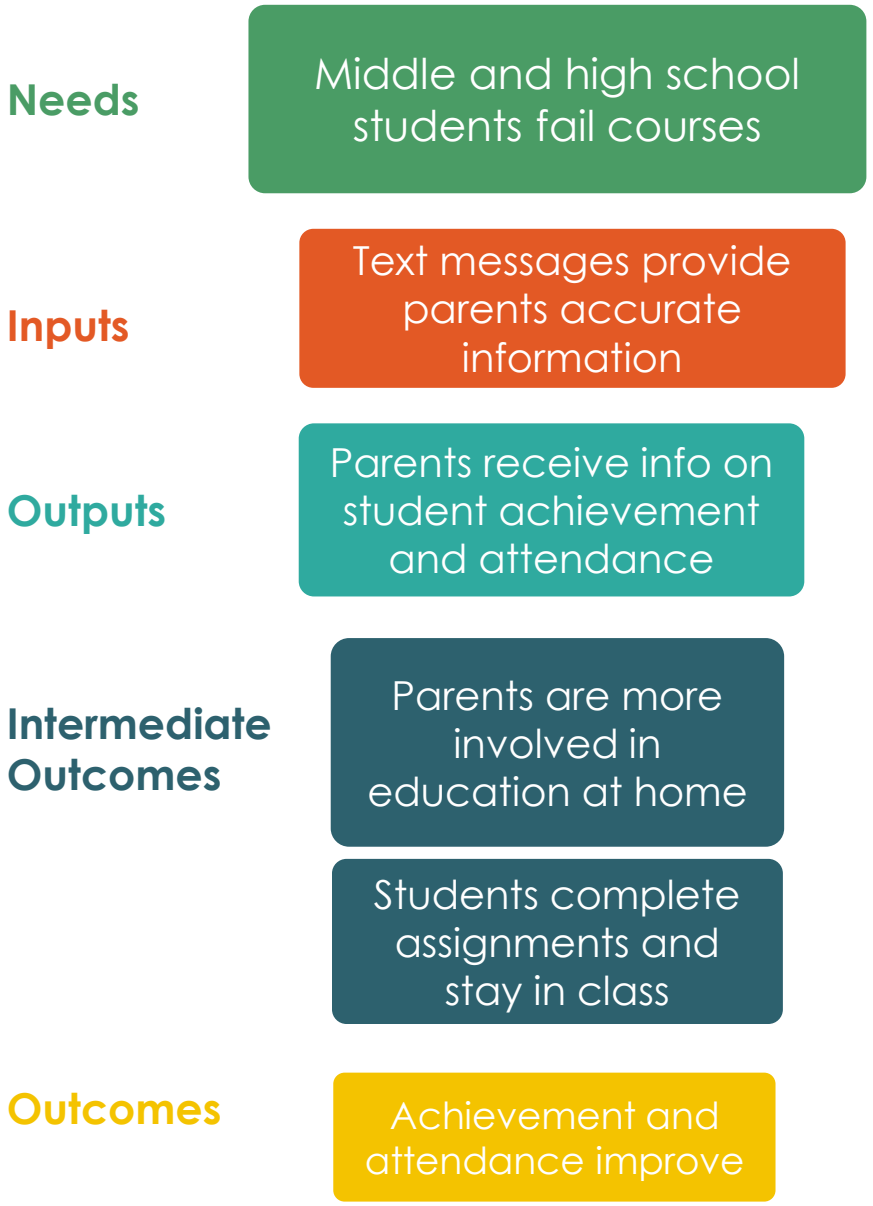
What does this descriptive data suggest about the underlying challenge?

- Most parents report speaking to their children **every day** about their homework
- **20 percent** of respondents' children had never missed an assignment even though **over 50 percent** of parents thought their children have never missed an assignment.
- **50 percent** of parents heard from the school less than once every three months
- **48 percent** of parents believed their child does not disclose enough information about their academic progress.

Share your thoughts by unmuting yourselves.

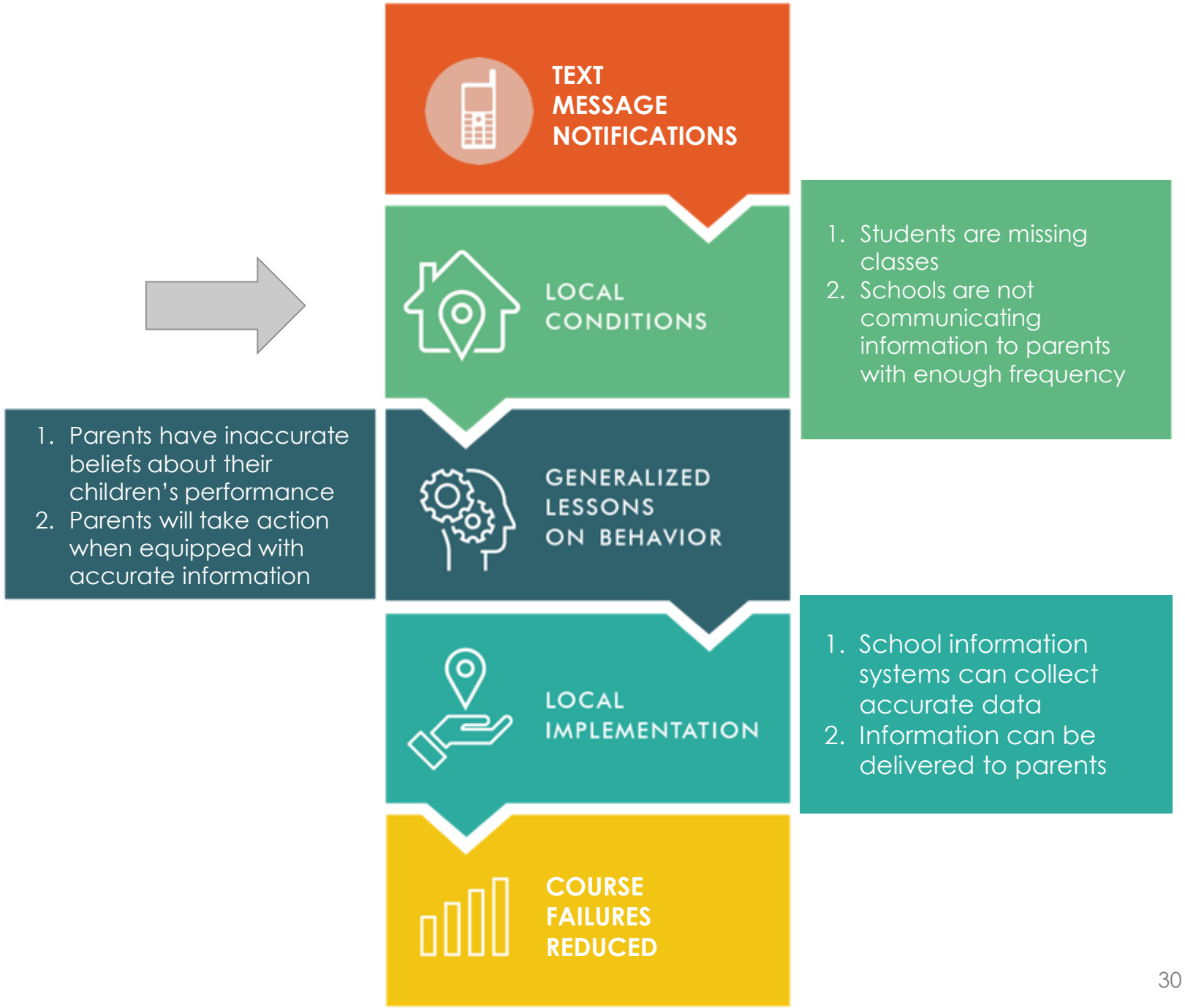
Generalizability Framework

Step 1: Write down the theory of change for the original program(s) and articulate the key assumptions for why it worked.



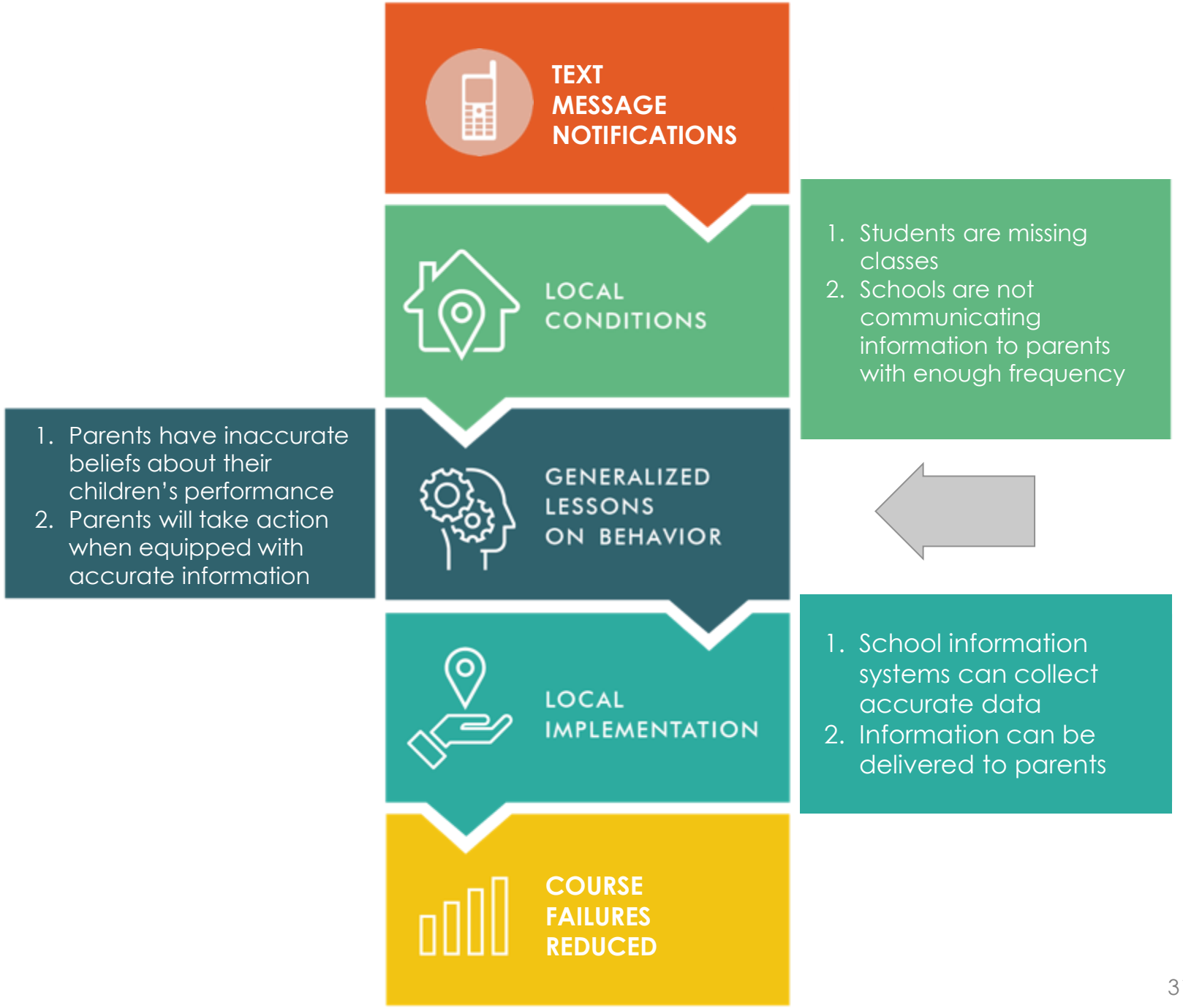
Generalizability Framework

Step 2: Find descriptive data to better understand if the underlying issue from the original context is also at play in your community.



Generalizability Framework

Step 3: Assess the strength of the evidence for the mechanisms that made program effective in the original context(s), and whether the key assumptions are likely to hold in your context.



Providing information to correct misperceptions/increase salience can change human behavior

- Criminal justice - Providing information on the consequences of not showing up for your court date reduced failure to appear rates in New York. (Cooke et al 2018)

- Health - Giving students information about the distribution of HIV infection rates by age and gender groups reduced risky sexual behavior in Kenya. (Dupas 2011)

- Education - Providing information about the financial returns to education led to improved learning outcomes in Chile. (Neilson et al 2019)

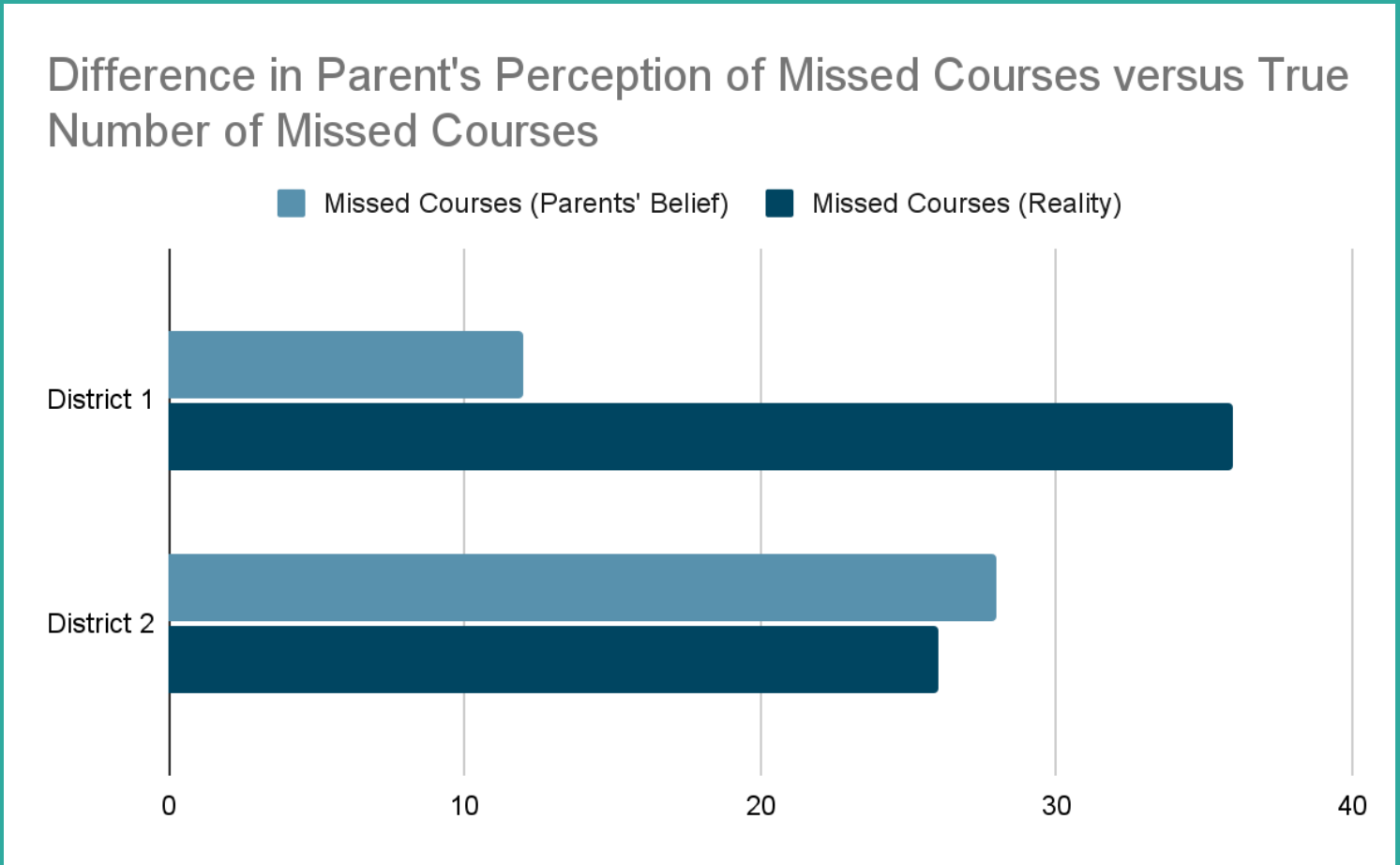
Imagine you can build in a notification system in a school district. Which school district might be a good fit?

A. District 1

B. District 2

C. Neither

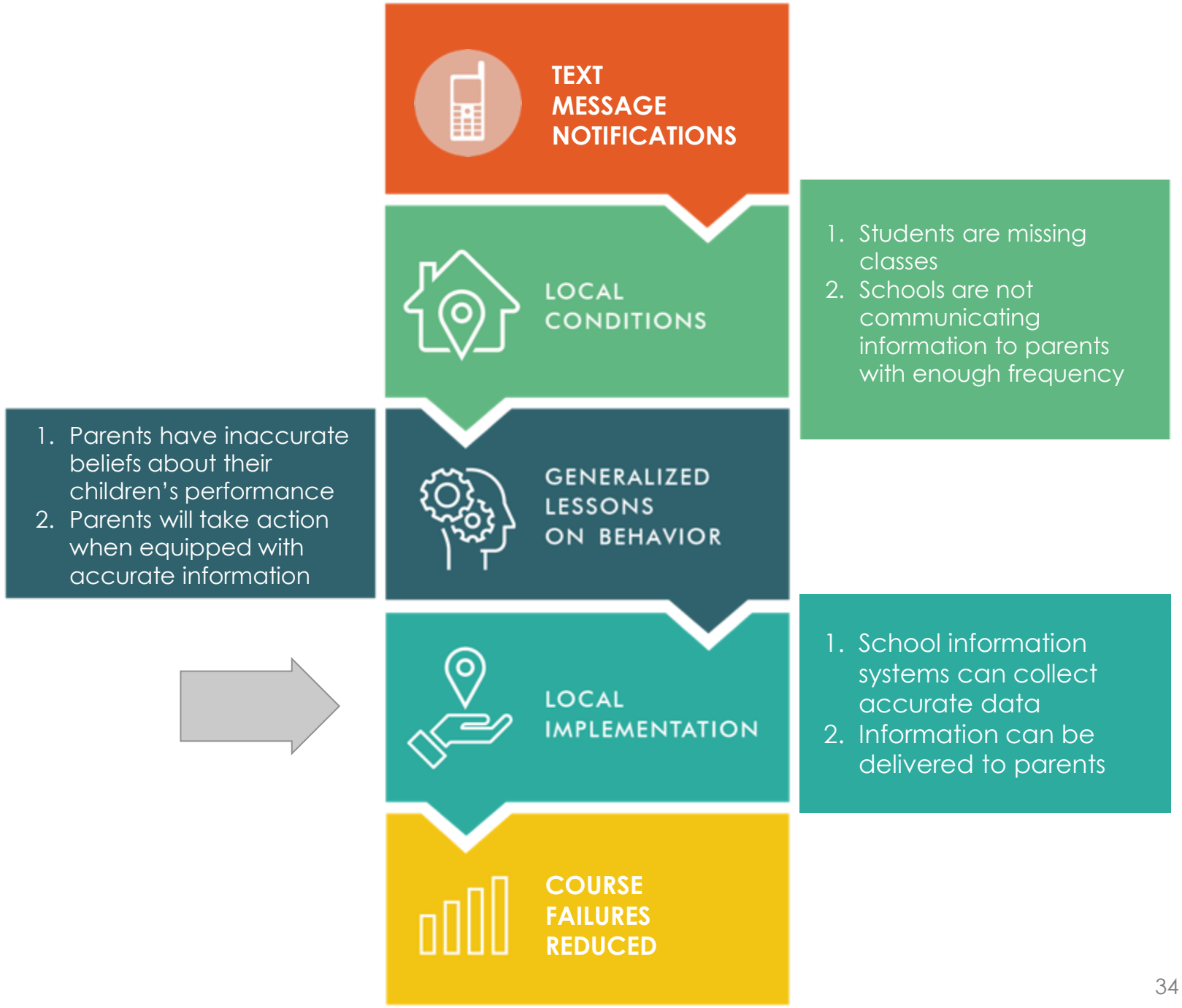
D. Both



Menti poll:

Generalizability Framework

Step 4: Assess whether you or another organization can successfully implement the intervention with fidelity to the original model.



Local Information to Guide Implementation

- Does your district collect regular and accurate data on missed courses, missed assignments, and student performance?
- Does your district have a way of integrating this data with an automated information system?
- Do parents in your district have regular access to text messages? Are the majority of the parents in your district able to read in English?

TEXT MESSAGE NOTIFICATIONS

COURSE FAILURES REDUCED

TEXT MESSAGE NOTIFICATIONS

LOCAL CONDITIONS

1. Students are missing classes
2. Schools are not communicating information to parents with enough frequency

1. Parents have inaccurate beliefs about their children's performance
2. Parents will take action when equipped with accurate information

GENERALIZED LESSONS ON BEHAVIOR

LOCAL IMPLEMENTATION

1. School information systems can collect accurate data
2. Information can be delivered to parents

COURSE FAILURES REDUCED

Applying the Generalizability Puzzle Framework

Examples

1. Texting parents about student performance
2. Tutoring/teaching at the right level

COVID-19 response in education

The School Year Really Ended in March

Abrupt closings have stalled the learning of millions of students. U.S. education needs a rescue, an economist says, and it won't be cheap.

Lily Padula

By Susan Dynarski

https://www.nytimes.com/2020/05/07/business/school-education-online-money.html

Imagine seeing this:

If $3x - 10 = 24$, then $x = ?$

For all a and b,
$6a^2b^3 - 3a^2b$ is equivalent to
which of the expressions?

When your math literacy is like this:

$8 + 14 - 7$

7×4

Example 2: Teaching at the right level/Tutoring

Challenge: Low reading and math performance among primary school students in rural India; Large classrooms → teachers are incentivized to teach at grade level.

What has worked?

Reorienting teaching to the level of the student consistently improves learning outcomes.

Pratham
Every Child In School and Learning Well

Banerjee et al. 2007; Banerjee et al. 2010; Banerjee et al. 2016; Banerjee et al. 2017

Example 2: Saga Education/Tutoring

Challenge: Low math performance among high school students in Chicago; Large classrooms → teachers are incentivized to teach at grade level.

What has worked?

Small group tutoring at the student's level consistently improves learning outcomes.

Cook et al. 2015

Saga Education

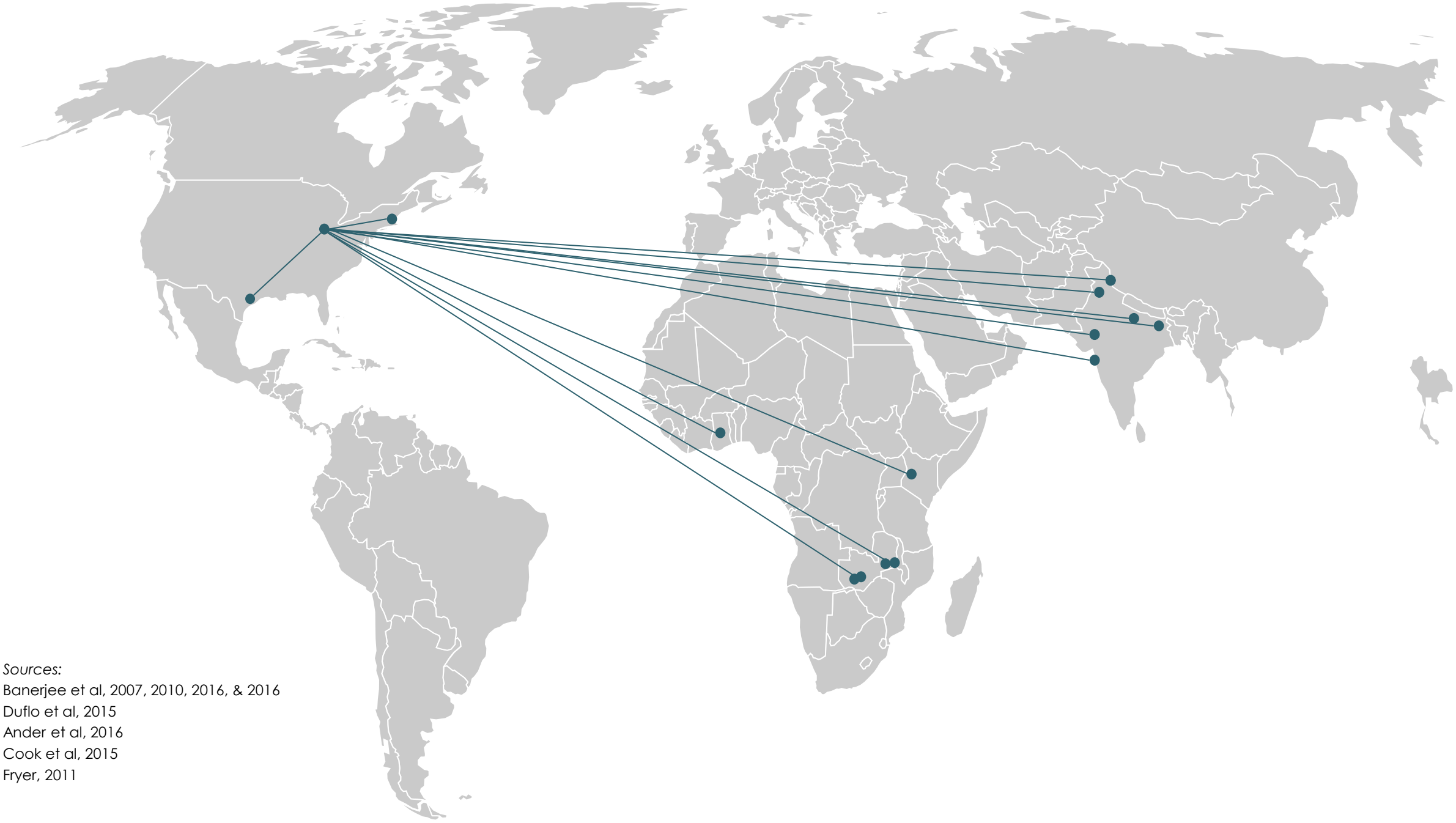
J-PAL affiliates and co-authors partnered with Chicago Public Schools to study the impact of Saga Education's model of individualized math tutoring on academic outcomes for 9th and 10th grade male students

- Saga assigned students to a **one-hour tutoring session every day as part of their regular class schedule**.
- **Tutors met with two students at a time** and divided instructional time evenly between **reviewing foundational skills—targeting instruction—and working on current topics from students' regular math classes**.

Results:

- Students in Saga learned an **extra one to two years' worth of math** beyond what their peers learned in an academic year. Tutoring raised participants' average national percentile rank on 9th and 10th grade math exams by more than 20 percent.

Cook et al. 2015



Sources:
Banerjee et al, 2007, 2010, 2016, & 2016
Duflo et al, 2015
Ander et al, 2016
Cook et al, 2015
Fryer, 2011

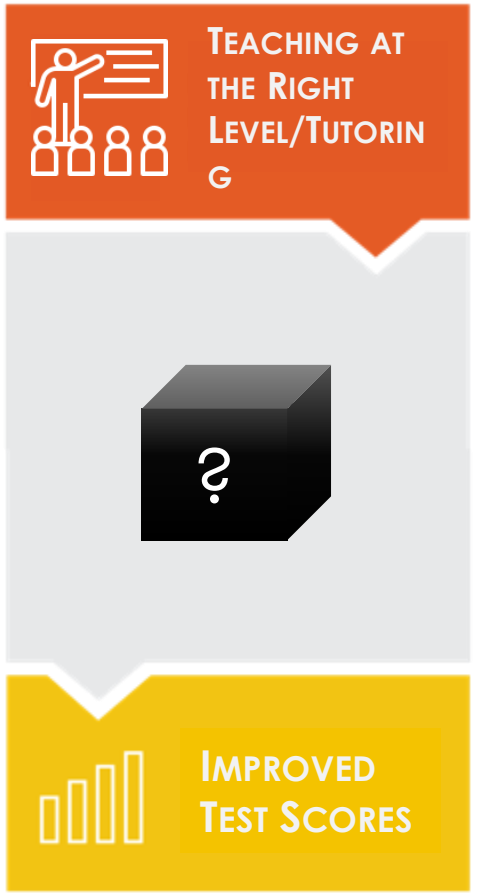
Example 2: Teaching at the right level

New Context:

Now let's say you lead a school district in North Carolina and you want to improve student outcomes. Should you consider a similar program?

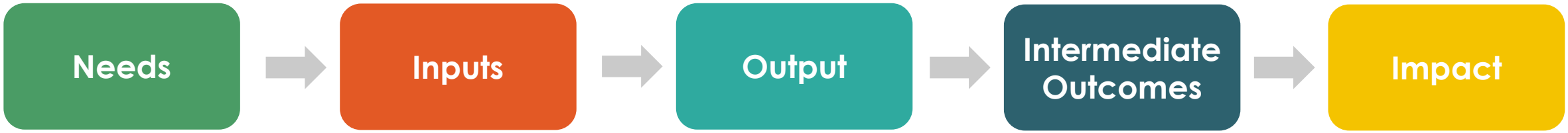
At first glance:

- The evaluations were conducted in India and Chicago; but will it work here?
- Intensive interventions may be costly



Teaching at the right level/Saga Tutoring
Step 1: Theory of Change

Step 1: Write down the theory of change for the original program(s) and articulate the key assumptions for why it worked.



Children have fallen years behind grade level.

Teachers are incentivized to teach at grade level.

TaRL: Teachers are trained to assess children and regroup them by learning level.

SAGA: Tutors are trained to teach students at their level.

Children receive smaller group instruction by learning level by teachers (TaRL) or tutors (SAGA).

Children learn more quickly when material is at their level.

Scores improve.

Teaching at the right level/Tutoring
Step 2: Local conditions

New Context: North Carolina school district

Step 2: Find descriptive data to better understand if the underlying issue from the original contexts is also at play in your community.

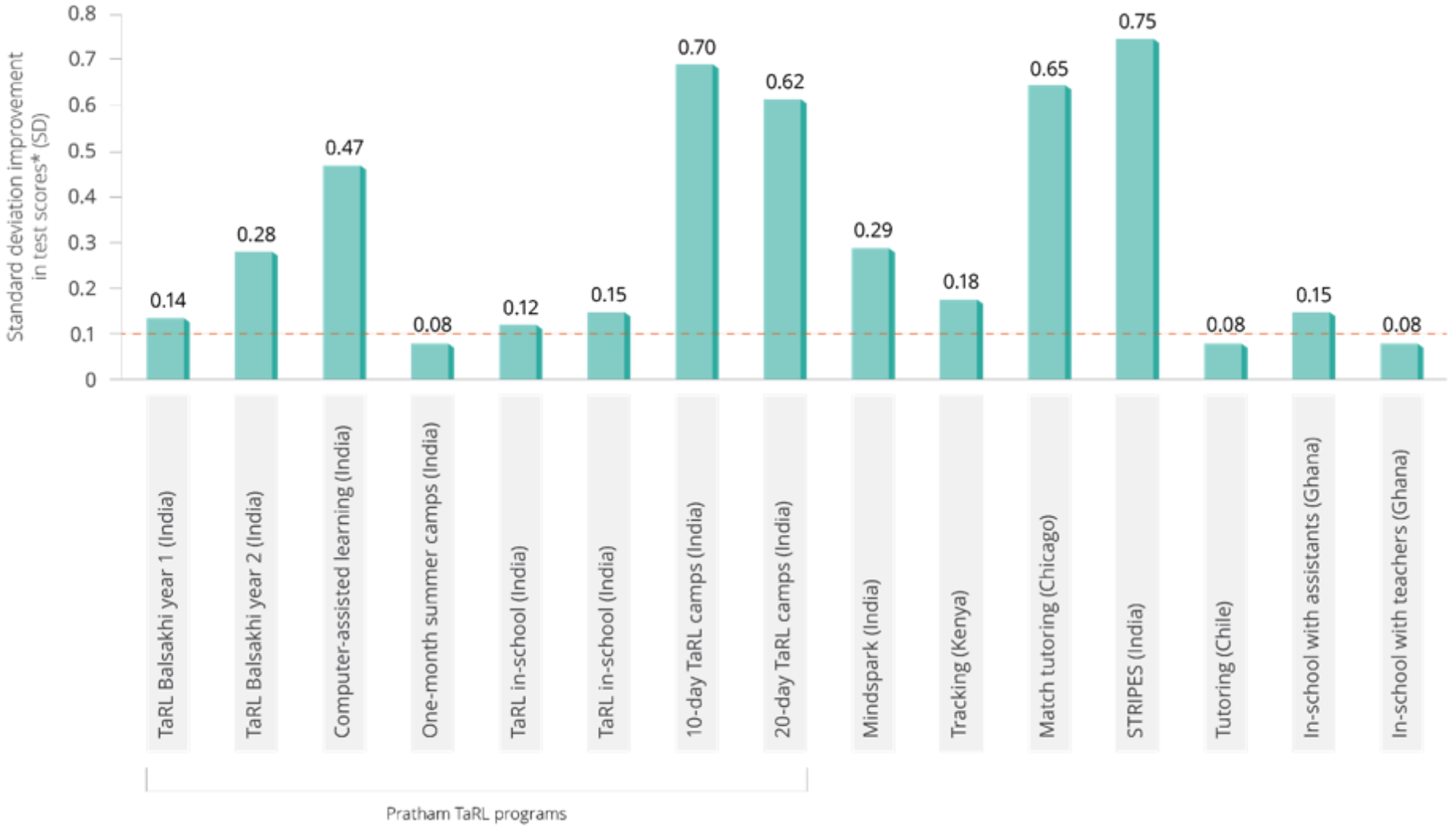
	India (original context)	**Chicago** (original context)	**North Carolina school district** (new context)
Academic performance	Grade 5 students are years behind in reading and math.	Grade 9 students are years behind in math.	
Variation in classrooms	Learning levels within each classroom are varied, and students have little recourse to learn basic skills if they have not mastered them in the foundational years.		

Teaching at the right level/Tutoring
Step 3: General Lessons from Existing Evidence

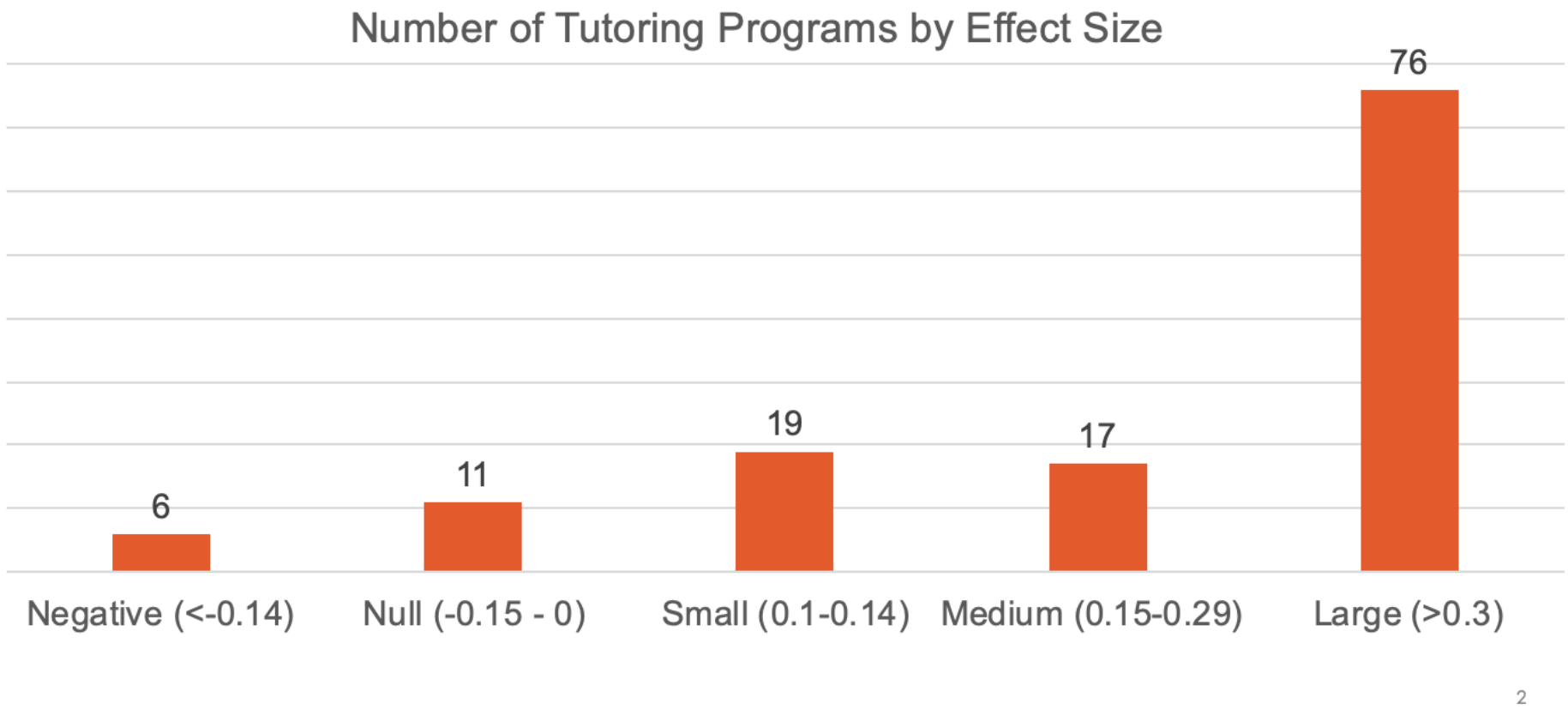
Step 3: Assess the strength of the evidence for the mechanisms that made the program effective in the original context(s), and whether the key assumptions are likely to hold in your context.

Six randomized evaluations in India find that programs that reorient classroom instruction to teach at the level of the student are **consistently effective**, raising test scores by between 0.07 and 0.70 standard deviations.

Tailored instruction: consistently positive impacts across contexts



Targeted instruction increases learning



For more, see: "The Transformative Potential of Tutoring for Pre K-12 Learning Outcomes"

Teaching at the right level
Step 4: Local Implementation

Step 4: Assess whether you or another organization can successfully implement the intervention with fidelity to the original model.

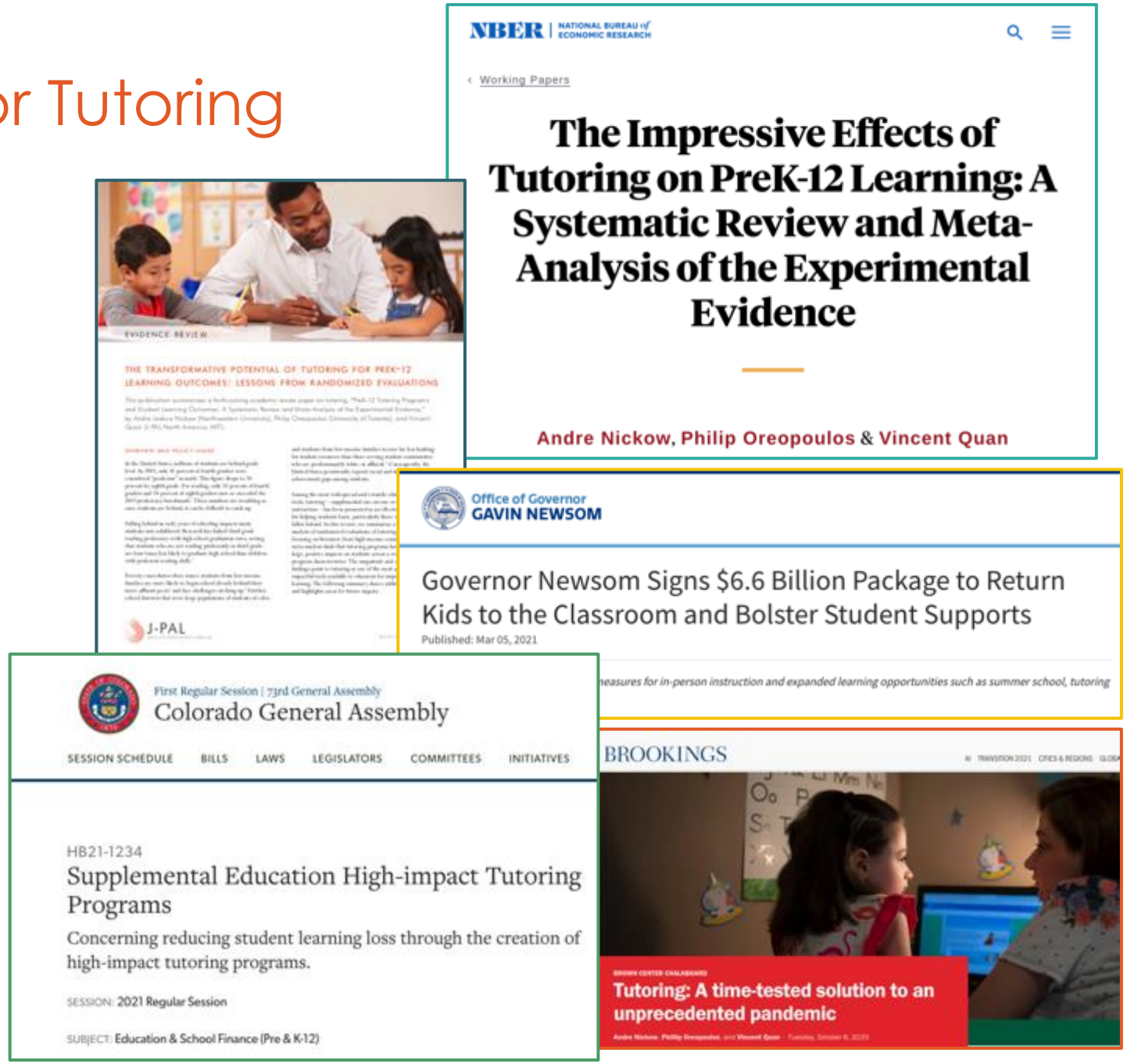
Adapt intervention to North Carolinian school district context:

- Can you align tutoring with relevant school materials/curriculum?
- Can your tutors assess where students are at?
- Can you train tutors from the local community and provide them with ongoing support?


TARGETED INSTRUCTION / TUTORING PROGRAM
LOCAL CONDITIONS
1. Literacy and numeracy rates are below grade level
2. Teachers face incentives to teach grade-level material, not catch-up material
GENERALIZED LESSONS ON BEHAVIOR
1. Students learn when material is at their level
LOCAL IMPLEMENTATION
1. Teachers/tutors trained in catch-up program
2. Time is devoted to catch-up program
3. Students attend catch-up classes targeted to their learning level
LEARNING OUTCOMES IMPROVE

Policy Impact: Funding for Tutoring

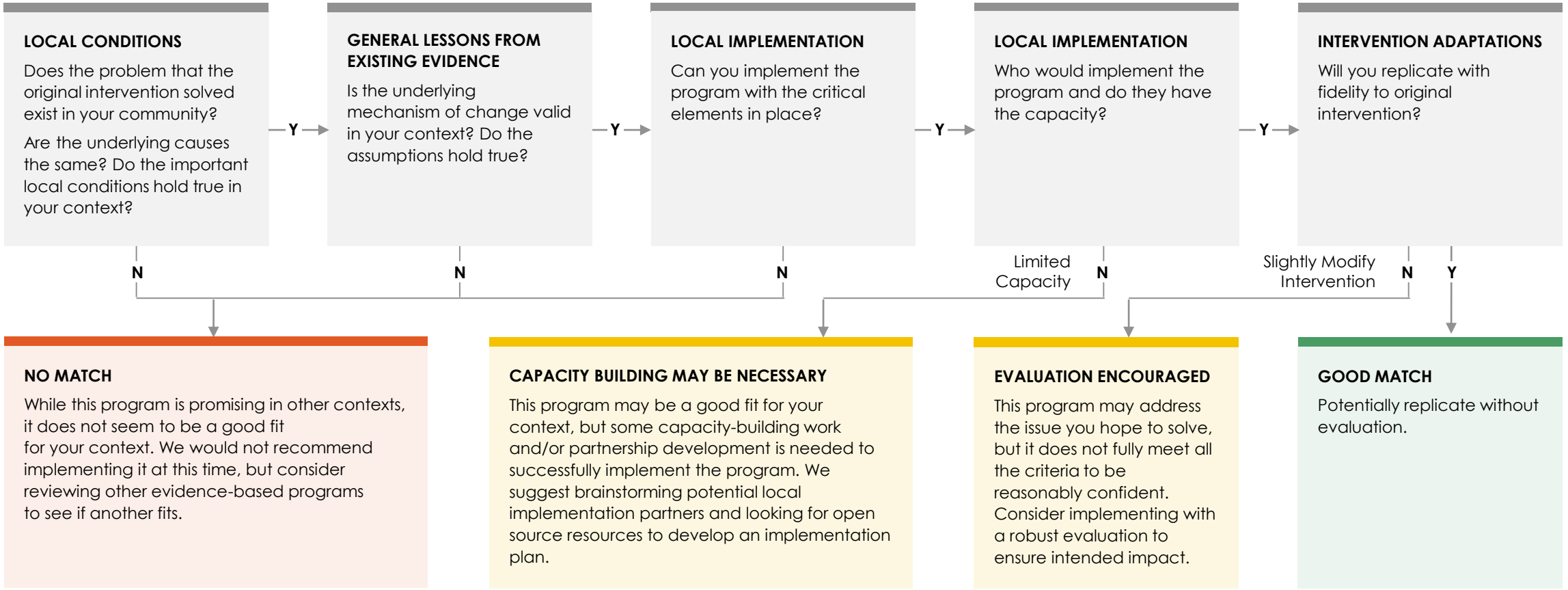
- Findings from J-PAL's tutoring research meta-analysis have informed state efforts to address learning loss caused by the Covid-19 pandemic
- This includes **California lawmakers' decision to pass an education package allocating $4.6 billion** to student recovery, tutoring, and integrated pupil supports, including **$460 million to hire professional tutors**
- The research has also informed a Colorado bill advocating for the establishment of statewide high-impact tutoring programs



EXERCISE

Putting it all together: Decision tree

Finally, once you have completed the steps of the generalizability framework, you can use the following decision tree to help you interpret your analysis



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Concluding Remarks

Conclusion

Does evidence from RCTs replicate to new contexts?
Too big a question. Break it down:

- What is the theory of change behind the intervention in the original RCT?
- Do the local conditions hold for that theory to apply?
- How strong is the evidence for the general behavioral change?
- What is the evidence that the implementation process can be carried out well?

Conclusion

- If we have enough evidence to act, do we have enough evidence to stop evaluating impact? (Always monitor)
  - We often need to act even when evidence is thin
- Often big overlap between when have enough evidence to launch a new initiative and when it is still worth evaluating
  - Questions may remain about best way to implement
- Tradeoff between evidence in new areas, versus more on improving evidence on refining a program

Final Takeaway

Are the locations identical?

Icon by Adrien Coquet from the Noun Project

Final Takeaway

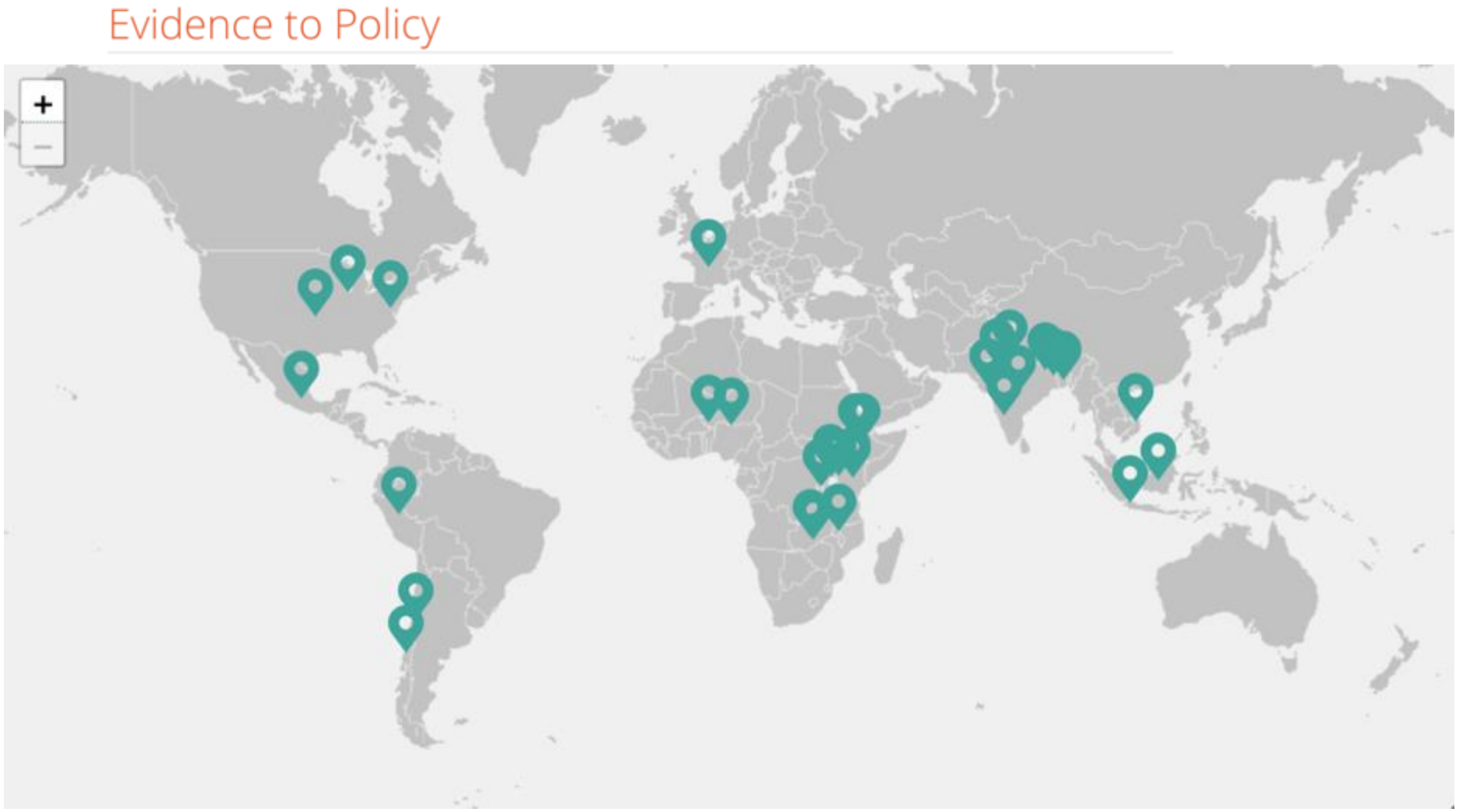
Are the locations identical?

Is there a similar problem?

Why did a solution work?

Icon by Adrien Coquet from the Noun Project

Over 400 million people reached by scaling up programs found to be effective by J-PAL RCTs



Evidence to Policy

Evidence from randomized evaluations is changing how we understand and address problems related to poverty. Policymakers, practitioners, and funders worldwide are increasingly applying this learning to social policies and programs.

Over 400 million people have been reached by programs that were scaled up after being evaluated by J-PAL affiliated researchers. Many more have benefitted from the several broader ways evidence can inform policy, outlined below.

Continue reading

Pathways to Policy Change

Below, you will find six pathways through which evidence can have an impact on policy and case studies that illustrate partnerships leading to policy impact.

Shifting global thinking

Knowledge generated by randomized evaluations has fundamentally shaped our understanding of many social policies.

Example case studies:

Free bednets to fight malaria

More...

Institutionalizing evidence use

Many organizations, including governments and large NGOs, have institutionalized processes for rigorously evaluating innovations and incorporating evidence into decision-making.

Example case studies:

A government innovation lab to improve education

More...

Applying research insights

Lessons from randomized evaluations have informed the design of programs.

Adapting and scaling a program

Programs originally evaluated in one context have been adapted and scaled in others.

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Thank you!

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Further reading and resources

- Bates and Glennerster, 2017, "The Generalizability Puzzle," *Stanford Social Innovation Review* https://ssir.org/articles/entry/the_generalizability_puzzle
- Kremer and Glennerster, 2012, Chapter in *Handbook of Health Economics*
- J-PAL Evidence to Policy page http://www.povertyactionlab.org/evidence-to-policy/
- J-PAL Self-Guided Case Study on Applying the Generalizability Framework to Complex Health Care https://www.nationalcomplex.care/research-policy/resources/toolkits/case-study-generalizability-framework/